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1987

PROJECT MANUAL  
for the  
CONSTRUCTION OF UTILITY SERVICE FOR THE BALCLUTHA  
at  
HYDE STREET PIER  
GOLDEN GATE NATIONAL RECREATION AREA  
SAN FRANCISCO, CALIFORNIA

Owner:

National Park Service  
Golden Gate National  
Recreation Area  
Fort Mason, Building 201  
San Francisco, CA 94123

Engineer:

ACE Pacific Company  
595 Market Street #2640  
San Francisco, CA 94105-2839

FINAL  
November 3, 1987

Lump sum bids are requested for the work indicated on the drawings and specifications as follows:

1. Electrical supply system, complete and ready for use.
2. Water supply system, complete and ready for use.
3. Fire alarm system, complete and ready for use.
4. Telephone system, complete and ready for use.

Award will be made for all items, any one item, or any combination of items as determined by the Contracting Officer.

UTILITY SERVICE FOR THE BALCLUTHA

AT HYDE STREET PIER

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PART 1-GENERAL

- 1.01 UNIQUENESS OF WORK: The Hyde Street Pier is the site of many articles of historic significance. Construction work must be performed with care to minimize impact and prevent damage to any article or structure within the pier complex. Methods necessary to complete this contract may require techniques not normally associated with every day construction techniques. The Contracting Officer's approval will be required in areas of question.
- 1.02 DESCRIPTION:
- A. The work consists of but is not necessarily limited to extending existing water, electrical power, alarm and/or telephone utilities on the pier to serve the historic ship Balclutha at her proposed birth near the outer end of the pier.
  - B. The work may be performed under separate contracts.
- 1.03 LOCATION: Hyde Street Pier is located on San Francisco Bay at the foot of Hyde Street in San Francisco California.
- 1.04 CONTRACTORS USE OF PREMISES:
- A. Construction Camp: Establishment of a camp will not be permitted.
  - B. The work hours will be agreed upon at the preconstruction conference, but in any case the normal work week will be Monday through Friday.
  - C. Hyde Street Pier will be open to the public. Work will have to be carefully coordinated with the National Park Service officials to ensure public safety.
  - D. Confine storage of materials to very limited areas approved by Contracting Officer.
  - E. Preservation of Natural Features: Confine all operations within the work limits of the project. Exercise special care to maintain all surroundings undamaged. Restore damaged areas at no additional expense to the Government.
  - F. Not Used.
  - G. Existing Utilities: Notify Contracting Officer and utility companies of proposed locations and times for work that will affect utilities.
    - 1. The Contractor shall be responsible for locating and preventing damage to known utilities. If damage occurs, repair utility at no additional expense to the Government.

2. If damage occurs to an unknown utility, repair utility. An equitable adjustment will be made in accordance with the changes clause of the General Provisions.

1.05 CONTRACTOR-FURNISHED ITEMS

All materials shall be Contractor-furnished from outside the park.

PART 2-PRODUCTS NOT USED

PART 3-EXECUTION NOT USED

END OF SECTION

PART 1-GENERAL

## 1.01 LAYOUT OF WORK

- A. The Contracting Officer will set a base line and bench mark for each area of work. The Contractor shall layout the work by accurately measuring from these controls. All work improperly located due to the Contractors errors or omissions shall be corrected by him at no additional expense to the Government.
- B. The Contractor shall preserve controls thus established. Controls originally set by the Contracting Officer that are destroyed by the Contractor will be replaced by the Contracting Officer, with the cost of replacement deducted from the Contractor's final payment.
- C. Locations on the drawings are subject to final adjustment by Contracting Officer before construction. The Contractor shall immediately notify the Contracting Officer of apparent errors discovered on the drawings on in the initial stakeout. If changes in stakeout are required, the Contractor shall cooperate with the Contracting Officer in prompt establishment of the field control for altered or adjusted work.
- D. Existing Monuments: All bench marks, land corners, and triangulation points, established by other surveys, existing within the construction area shall be preserved. If existing monuments interfere with the work, secure written permission before removing them.

## 1.02 QUANTITY SURVEYS NOT USED

PART 2-MATERIALS NOT USEDPART 3-EXECUTION NOT USED

END OF SECTION

## 1.01 REFERENCED STANDARDS:

- A. The following abbreviations, which may be used in the construction specifications, refer to the organizations and specifications of the organizations listed below:

AA	- Aluminum Association 818 Connecticut Avenue, N.W. Washington, D.C. 20006
AABC	- Associated Air Balance Council 1518 K Street N.W. Washington, D.C. 20005
AAMA	- Architectural Aluminum Manufacturers Association 2700 River Road, Suite 118 Des Plaines, Illinois 60016
AAN	- American Association of Nurserymen 1250 Eye Street, N.W., Suite 500 Washington, D.C. 20005
AASHTO	- American Association of State Highway and Transportation Officials 444 North Capitol Washington, D.C. 20002
ABMA	- American Boiler Manufacturers Association Suite 160, 950 N. Glebe Road Arlington, Virginia 22203
ACI	- American Concrete Institute Box 19150 Redford Station Detroit, Michigan 48219
ACPA	- American Concrete Pipe Association 8320 Old Courthouse Road Vienna, Virginia 22180
ADC	- Air Diffusion Council - Test Code
AGA	- American Gas Association 1515 Wilson Boulevard Arlington, Virginia 22209
AHA	- American Hardboard Association 887-B Wilmette Road Palatine, Illinois 60067
AISC	- American Institute of Steel Construction, Inc. 400 N. Michigan Avenue Chicago, Illinois 60611
AISI	- American Iron and Steel Institute 1000 16th Street, N.W. Washington, D.C. 20036
AITC	- American Institute of Timber Construction 333 W. Hampden Avenue Englewood, Colorado 80110 30 W. University Drive Arlington Heights, Illinois 60004



AMCA - Air Moving and Conditioning Association  
 ANSI - American National Standards Institute  
       1430 Broadway  
       New York, New York 10018  
 APA - American Plywood Association  
       P.O. Box 11700  
       Tacoma, Washington 98411  
 ARI - Air Conditioning and Refrigeration Institute  
       1501 Wilson Blvd., Suite 600  
       Arlington, Virginia 22209  
 ARMA - Asphalt Roofing Manufacturers Association  
       355 Lexington Avenue  
       New York, New York 10017  
 ASA - American Standards Association  
 ASHRAE - American Society of Heating, Refrigeration and  
           Air-Conditioning Engineers  
           1791 Tullie Circle, N.E.  
           Atlanta, Georgia 30329  
 ASLA - American Society of Landscape Architects  
       1733 Connecticut Avenue, N.W.  
       Washington, D. C. 20009  
 ASME - American Society of Mechanical Engineers  
       345 East 47th Street  
       New York, New York 10017  
 ASPE - American Society of Plumbing Engineers  
       15223 Ventura Boulevard, Suite 811  
       Sherman Oaks, California 91403  
 ASTM - American Society for Testing and Materials  
       1916 Race Street  
       Philadelphia, Pennsylvania 19103  
 AWI - Architectural Woodwork Institute  
       2310 S. Walter Reed Drive  
       Arlington, Virginia 22206  
 AWWA - American Wood-Preserver's Association  
       P.O. Box 849  
       Stevensville, Maryland 21666  
 AWBP - American Wood Preserver's Bureau  
       P.O. Box 6085, 2772 S. Randolph Street  
       Arlington, Virginia 22206  
 AWS - American Welding Society, Inc.  
       550 N.W. LeJune Road, P.O. Box 351040  
       Miami, Florida 33135  
 AWWA - American Water Works Association  
       6666 W. Quincy Avenue  
       Denver, Colorado 80235  
 BHMA - Builders Hardware Manufacturer's Association  
       60 East 42nd Street, Room 1807  
       New York, New York 10165  
 BIA - Brick Institute of America  
       1750 Old Meadow Road  
       McLean, Virginia 22101

CBM - Certified Ballast Manufacturers  
722 Hanna Building, 1422 Euclid Avenue  
Cleveland, Ohio 44115-2094

CDA - Copper Development Association  
Box 1840 Greenwich Office Park 2  
Greenwich, Connecticut 06836

CE - Corps of Engineers (U.S. Department of the Army)  
Washington, D.C. 20315

CGA - Compressed Gas Association, Inc.

CISPI - Cast Iron Soil Pipe Institute  
1499 Chain Bridge Road, Suite 203  
McClean, Virginia 22101

CLFMI - Chain Iron Soil Pipe Institute  
1101 Connecticut Avenue, N.W., Suite 700  
Washington, D.C. 20036

CRA - California Redwood Association  
591 Redwood Highway, Suite 3100  
Mill Valley, California 94941

CRI - Carpet and Rug Institute  
Box 2048  
Dalton, Georgia 30720

CRSI - Concrete Reinforcing Steel Institute  
933 N. Plum Grove Road  
Schaumburg, Illinois 60195

CS - Commercial Standards of NBS (U.S. Department of Commerce)  
Government Printing Office  
Washington, D.C. 20402

CTI - Ceramic Tile Institute  
700 N. Virgil Avenue  
Los Angeles, California 90029

DHI - Door and Hardware Institute  
7711 Old Springhouse Road  
McLean, Virginia 22102

FGMA - Flat Glass Marketing Association  
White Lakes Professional Building, 3310 Harrison  
Topeka, Kansas 66611

FHA - Federal Housing Administration (U.S. Department of Housing  
and Urban Development)  
451 7th Street, S.W.  
Washington, D.C. 20201

FHAWA - Fine Hardwoods/American Walnut Association  
5603 W. Raymond Street, Suite 0  
Indianapolis, Indiana 46241

FIA - Factory Insurance Association

FM - Factory Mutual Engineering Corporation  
1151 Boston-Providence Turnpike  
P.O. Box 688  
Norwood, Massachusetts 02062

FS - Federal Specifications (General Services Administration)  
Building 197, Washington Navy Yard, S.E.  
Washington, D.C. 20407

GA - Gypsum Association  
1603 Orrington Avenue  
Evanston, Illinois 60201

HI - Hydronics Institute  
 35 Russo Place, P.O. Box 218  
 Berkeley Heights, New Jersey 07922  
 HMA - Hardwood Manufacturers Association  
 805 Sterick Building  
 Memphis, Tennessee 38103  
 HPMA - Hardwood Plywood Manufacturers Association  
 P.O. Box 2789  
 Reston, Virginia 22090  
 IA - Irrigation Association  
 13975 Connecticut Avenue  
 Silver Spring, Maryland 20906-2976  
 ICBO - International Conference of Building Officials  
 5360 S. Workman Mill road  
 Whittier, California 90601  
 ICEA - Insulated Cable Engineers Association, Inc.  
 P.O. Box P  
 South Yermouth, Massachusetts 02664  
 IEEE - The Institute of Electrical and Electronics Engineers  
 345 East 47th Street  
 New York, New York 10017  
 IES - Illuminating Engineering Society of North America  
 345 East 47th Street  
 New York, New York 10017  
 ILI - Indiana Limestone Institute of America  
 Suite 400, Stone City Bank Building  
 Bedford, Indiana 47421  
 IRI - Industrial Risk Insurance  
 LIA - Lead Industries Association, Inc.  
 292 Madison Avenue  
 New York, New York 10017  
 LPI - Lightning Protection Institute  
 48 N. Ayer Street, P.O. Box 406  
 Harvard, Illinois 60033  
 MBMA - Metal Building Manufacturer's Association  
 2130 Keith Building  
 Cleveland, Ohio 44115  
 MFMA - Maple Flooring Manufacturer's Association, Inc.  
 8600 W. Bryn Mawr Avenue, Suite 720S  
 Chicago, Illinois 60631  
 MIA - Marble Institute of America  
 33505 State Street  
 Farmington, Michigan 48204  
 MIMA - Mineral Insulation Manufacturer's Association  
 382 Springfield Avenue  
 Summit, New Jersey 07901  
 MLSFA - Metal Lath/Steel Framing Association  
 221 N. LaSalle Street  
 Chicago, Illinois 60601  
 MS - Military Standardization Documents (U.S. Department of  
 Defense)  
 Naval Publications and Forms Center, 5801 Tabor Ave.  
 Philadelphia, Pennsylvania 19120

MSHA - Mine Safety and Health Administration  
Room 601, 4015 Wilson Blvd.  
Arlington, Virginia 22203

MSS - Manufacturers Standardization Society of the Valve and  
Fittings Industry  
127 Park Street, N.E.  
Vienna, Virginia 22180

NAAM - The National Association of Architectural Metal  
Manufacturers  
221 N. LaSalle Street, Suite 2026  
Chicago, Illinois 60601

NACE - National Association of Corrosion Engineers  
P.O. Box 218340  
Houston, Texas 77218

NAPCA - National Association of Pipe Coating Applicators  
717 Commercial National Bank Building  
Shreveport, Louisiana 71101

NBHA - National Builder's Hardware Association  
711 Old Spring House Road  
McLean, Virginia 22101

NBS - National Bureau of Standards (U.S. Department of Commerce)  
Gaithersburg, Maryland 20834

NCMA - National Concrete Masonry Association  
P.O. Box 781  
Herndon, Virginia 22070

NCPI - National Clay Pipe Institute  
P.O. Box 310, 2024 Route 176  
Crystal Lake, Illinois 60014

NCPWB - National Certified Pipe Welding Bureau

NEC - National Electrical Code (by NFPA)

NELMA - Northeastern Lumber Manufacturers' Association  
4 Fundy Road  
Falmouth, Maine 04105

NEII - National Elevator Industry, Inc.  
600 Third Avenue  
New York, New York 10016

NEMA - National Electrical Manufacturers Association  
2101 L Street, N.W.  
Washington, D.C. 20037

NFPA - National Fire Protection Association  
Batterymarch Park  
Quincy, Massachusetts 02269

NFPA - National Forest Products Association  
1619 Massachusetts Avenue, N.W.  
Washington, D.C. 20036

NHLA - National Hardwood Lumber Association  
P.O. Box 24518  
Memphis, Tennessee 38104

NHPMA - Northern Hardwood and Pine Manufacturers Association, Inc.  
8600 W. Bryn Mawr Avenue, Suite 720  
Chicago, Illinois 60631

NIOSH - National Institute of Occupational Safety and Health  
 1600 Clifton Road, N.E. NIOSH Building 1  
 Room 3007  
 Atlanta, Georgia 30333

NOFMA - National Oak Floor Manufacturing Association  
 804 Sterick Building  
 Memphis, Tennessee 38108

NPA - National Particleboard Association  
 2306 Perkins Place  
 Silver Spring, Maryland 20910

NPCA - National Paint and Coating Association  
 1500 Rhode Island Avenue, N.W.  
 Washington, D.C. 20005

NRCA - National Roofing Contractor's Association  
 8600 Bryn Mawr Avenue  
 Chicago, Illinois 60631

NSF - National Sanitation Foundation  
 3475 Plymouth Road, P.O. Box 1468  
 Ann Arbor, Michigan 48106

NTMAX - The National Terrazo and Mosaic Association  
 3166 Des Plaines Avenue  
 Des Plaines, Illinois 60018

NWMA - National Woodwork Manufacturer's Association  
 205 West Touhy Avenue  
 Park Ridge, Illinois 60068

OSHA - Occupational Safety and Health Administration (U.S.  
 Department of Labor)  
 Government Printing Office  
 Washington, D.C. 20402

PCA - Portland Cement Association  
 5420 Old Orchard Road  
 Skokie, Illinois 60076

PCI - Prestressed Concrete Institute  
 201 N. Wells Street  
 Chicago, Illinois 60606

PDI - Plumbing and Drainage Institute

PEI - Porcelain Enamel Institute, Inc.  
 1911 N. Fort Myer Drive  
 Rosslyn, Arlington, Virginia 22209

PI - Perlite Institute, Inc.  
 6268 Jericho Turnpike  
 Commack, New York 11725

PS - Product Standard of NBS (U.S. Department of Commerce)  
 Government Printing Office  
 Washington, D.C. 20402

RCSHSB - Red Cedar Shingle and Handsplit Shake Bureau  
 515 11th Avenue, Suite 275  
 Bellvue, Washington 98004

RFCI - Resilient Floor Covering Institute  
 966 Hungerford Drive, Suite 12-B  
 Rockville, Maryland 20850

RIS - Redwood Inspection Service (Grading Rules)  
 591 Redwood Highway, Suite 3100  
 Mill Valley, California

SDI - Steel Door Institute  
712 Lakewood Center North, 14600 Detroit Avenue  
Cleveland, Ohio 44107

SFPA - Southern Forest Product Association  
P.O. Box 52468  
New Orleans, Louisiana 70152

SIGMA - Sealed Insulating Glass Manufacturers Association  
111 E. Wacker Drive  
Chicago, Illinois 60601

SJI - Steel Joist Institute  
Suite A, 1205 48th Avenue North  
Myrtle Beach, South Carolina 29577

SMACNA - Sheet Metal and Air-Conditioning Contractors' National  
Association  
P.O. Box 70  
Merrifield, Virginia 22116

SPIB - Southern Pine Inspection Bureau (Grading Rules)  
4709 Scenic Highway  
Pensacola, Florida 32593

SSPC - Steel Structures Painting Council  
4400 Fifth Avenue  
Pittsburg, Pennsylvania 15213

SWI - Steel Window Institute  
1230 Keith Building  
Cleveland, Ohio 44115

TCA - Tile Council of America  
P.O. Box 326  
Princeton, New Jersey 08540

TIMA - Thermal Insulation Manufacturers Association  
7 Kirby Plaza  
Mount Kisco, New York 10549

TPI - Truss Plate Institute  
100 W. Church Street  
Fredick, Maryland 21701

UBC - Uniform Building Code (by ICB0)

UL - Underwriters Laboratories  
333 Pfinsten Road  
Northbrook, Illinois 60062

UMC - Uniform Mechanical Code

UPC - Uniform Plumbing Code

WCLIB - West Coast Lumber Inspection Bureau (Grading Rules)  
P.O. Box 23145  
Portland, Oregon 97223

WIC - Woodwork Institute of California  
1833 Broadway, P.O. Box 11428  
Fresno, California 93773

WMMP - Wood Moulding and Millwork Producers Association  
1730 S.W. Skyline, P.O. Box 25278  
Portland, Oregon 97225

WRI - Wire Reinforcement Institute, Inc.  
8361A Greensboro Drive  
McLean, Virginia 22102

WWPA - Western Wood Product Association (Grading Rules)  
1500 Yeon Building  
Portland, Oregon 97204  
WWPA - Woven Wire Products Association  
2515 N. Nordica Avenue  
Chicago, Illinois 60635

PART 2-PRODUCTS NOT USED

PART 3-EXECUTION NOT USED

END OF SECTION

PART 1-GENERAL

## 1.01 DESCRIPTION:

- A. The work of this section consists of establishing an effective accident prevention program and providing a safe environment for all personnel and visitors.

## 1.02 QUALITY ASSURANCE:

- A. Clauses entitled "Accident Prevention" and "Permits and Responsibilities" of the General Provisions. In case of conflicts between Federal, state, and local safety and health requirements, the most stringent shall apply. Equipment or tools not meeting OSHA requirements will not be allowed on the project sites. Failure to comply with the requirements of this section and related sections may result in suspension of work.

## 1.03 SUBMITTALS:

- A. As specified in Section 01300.
- B. Accident Prevention Program: Before on-site work begins, submit for approval the accident prevention program. The Contracting Officer will review the proposed program for compliance with OSHA project requirements. If the program requires any revisions or corrections, the Contractor shall resubmit the program within 10 days. No progress payments will be processed until the program is approved. The program shall include:
  - 1. Name of responsible supervisor to carry out the program.
  - 2. Weekly and monthly safety meetings schedule and possible topics.
  - 3. First aid procedures.
  - 4. Outline of each phase of the work, the hazards associated with each major phase, and the methods proposed to ensure property protection and safety of the public, National Park Service personnel, and Contractor's employees. Identify the work included under each phase by reference to specification section or division numbers.
  - 5. Planning for possible emergency situations, such as fires, cave-ins, slides, and wind storms. Such planning shall take into consideration the nature of construction, site conditions, and degree of exposure of persons and property.
  - 6. Training, both initial and continuing.



7. Housekeeping - Section 01560.

8. Fire Protection - Section 01510.

- C. Certificates: Provide certificates from a mechanic that all mechanical equipment has been inspected and meets OSHA requirements.
- D. Submit a copy of test reports, as required by OSHA, for personnel working with hazardous materials.
- E. Submit a report of safety meetings and inspections.
- F. Upon request, submit proof of employee's qualifications to perform assigned duties in a safe manner.

1.04 ACCIDENT REPORTING:

- A. Reportable Accidents: A reportable accident is defined in the General Provisions and includes fires. Within 7 days of a reportable accident, fill out and forward to the Contracting Officer a DI-134 form, which may be obtained from Contracting Officer.
- B. All Other Accidents: The Contractor shall report all other accidents to the Contracting Officer as soon as possible and assist the Contracting Officer and other officials as required in the investigation of the accident.

1.05 QUALIFICATIONS OF EMPLOYEES:

- A. Ensure that employees are physically qualified to perform their assigned duties in an safe manner.
- B. Do not allow employees to work whose ability or alertness is impaired because of drugs, fatigue, illness, intoxication, or other conditions that may expose themselves or others to injury.
- C. Operators of vehicles, mobile equipment, hoisting equipment, and hazardous plant equipment shall be able to understand signs, signals, and operating instructions, and be capable of operating such equipment. Provide operating instructions for all equipment. Newly hired operators shall be individually tested by an experienced operator or supervisor to determine if they are capable of safely operating equipment.

PART 2-PRODUCTS

2.01 FIRST AID FACILITIES:

- A. Provide adequate facilities for the number of employees and the type of construction at the site.

2.02 PERSONNEL PROTECTIVE EQUIPMENT:

- A. Meet requirements of NIOSH and MSHA, where applicable, as well as ANSI.

2.03 BARRIER:

- A. Refer Section 01530.

PART 3-EXECUTION

3.01 EMERGENCY INSTRUCTION:

- A. Post telephone numbers and reporting instructions for ambulance, physician, hospital, fire department, and police in conspicuous locations at the work site.

3.02 PROTECTIVE EQUIPMENT:

- A. Inspect personal protective equipment daily and maintain in a serviceable condition. Clean, sanitize and repair, as appropriate, personal items before issuing them to another individual.
- B. Inspect and maintain other protective equipment and devices before use and on a periodic basis to insure safe operation.

3.03 SAFETY MEETINGS:

- A. As a minimum, conduct weekly 15-minute "toolbox" safety meetings. These meetings shall be conducted by a foreman and attended by all construction personnel at the worksite.
- B. Conduct monthly safety meetings for all levels of supervision. Notify the Contracting Officer so that he may attend. These meetings shall be used to review the effectiveness of the Contractor's safety effort, to resolve current health and safety problems, to provide a forum for planning safe construction activities, and for updating the accident prevention program. The Contracting Officer will enter the results of the meeting into his daily log.

3.04 HARD HATS AND PROTECTIVE EQUIPMENT AREAS:

- A. A hard hat area will be mutually agreed upon by the Contracting Officer and the Contractor and so designated by a physical barrier.
- B. It is the Contractor's responsibility to require all those working on or visiting the site to wear hard hats and other necessary protective equipment at all times. As a minimum, provide three hard hats for use by visitors.

3.05 TRAINING:

- A. First Aid: Provide adequate training to ensure prompt and efficient

first aid.

- B. Hazardous Material: Train and instruct each employee exposed to hazardous material in safe and approved methods of handling and storage. Hazardous materials are defined as explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful substances that could cause death or injury.

END OF SECTION

PART 1-GENERAL

## 1.01 SUBMITTAL PROCEDURE:

- A. At least 21 days before need for approval, Contractor shall forward all submittals to the Contracting Officer. Unless a different number is called for in the individual sections, submit five copies of each shop drawing, three specimens of each sample and five copies of all other submittals requested, all of which will be retained by Contracting Officer. Contractor shall submit, in addition, whatever copies he wants returned to him.
- B. Coordinate all submittals and review them for legibility, accuracy, completeness, and compliance with contract requirements. Submittals without evidence of Contractor's approval will be returned for resubmission. List submittals on National Park Service form DSC-1(CS). Contracting Officer will provide a project identification stamp and an approval stamp. Imprint each sheet or item with both stamps and fill in the blanks in the identification stamp.
- C. Forward submittals that are related to or affect each other as a package to facilitate coordinated review. Uncoordinated submittals will be rejected.
- D. Contracting Officer reserves the right to require submittals in addition to those called for in individual sections.

## 1.02 CONTRACTING OFFICER'S APPROVAL:

- A. Contracting Officer will indicate his approval or disapproval at each submittal, and his reasons for disapproval. When Contracting Officer has approved submittals, he will return Contractor's copies. Any work done before approval shall be at Contractor's own risk.

## 1.03 SHOP DRAWINGS:

- A. As specified in the individual sections. Identify each copy of shop drawings with contract drawing number in lower right hand corner.

## 1.04 SAMPLES:

- A. As specified in the individual sections. Samples shall be large enough to illustrate clearly functional characteristics and full range of color, texture or pattern.

## 1.05 CERTIFICATES:

- A. As specified in the individual sections.

## 1.06 MANUFACTURER'S LITERATURE:

Balclutha

01300-1

A. As specified in the individual sections.

1.07 OPERATION AND MAINTENANCE INSTRUCTIONS:

A. As specified in the individual sections.

1.08 SCHEDULES:

- A. Progress schedule: As soon as possible after Notice of Award and before beginning any work, submit four copies of a Progress Schedule (normally in bar chart form) showing estimated starting and completion dates for each part of the work. The first progress payment will not be issued until the progress schedule is submitted.
- B. Schedule of Values: Submit a schedule of dollar values based on the Contract Bid Schedule including all bid items. Break down into components parts, each bid item involving a series of operations for which progress payments may be requested. The total costs for the component parts shall equal the bid amount for that item and the total cost of all items shall equal the contract sum. The Contracting Officer may request data to verify accuracy of dollar values. The Schedule of Values will form the basis for progress payments as provided in the General Provisions.
- C. Review of Schedules: Submit Schedule of Values and Progress Schedule as a package. Contracting Officer will review the Progress Schedule and the Schedule of Values for format and content.

PART 2-PRODUCTS NOT USED

PART 3-EXECUTION NOT USED

END OF SECTION

PART 1-GENERAL

## 1.01 DESCRIPTION:

- A. The work of this section consists of providing temporary services required for Contractor's performance of the work of this Contract.

PART 2-PRODUCTS

## 2.01 GENERAL:

- A. Temporary materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

## 2.02 SANITARY FACILITIES:

- A. The Contractor shall have access to existing toilet facilities at the Park and will be held responsible for all damage to these facilities during construction.

## 2.03 FIRE PROTECTION EQUIPMENT:

- A. UL rated Class 10, A:B:C carbon dioxide extinguisher.

PART 3-EXECUTION

## 3.01 ELECTRICITY AND LIGHTING:

- A. Provide connections to existing facilities, sized to provide service required. The Government shall pay the costs of power used.
- B. When temporary connections are removed, restore existing utility service to its original condition.

## 3.02 TELEPHONE:

- A. If a phone is desired, make arrangements with telephone company and pay all costs.
- B. Remove temporary service and restore service to the original condition.

## 3.03 WATER:

- A. Make connections to existing facilities for potable water. The Government will pay for water used.
- B. Furnish cool, potable water for construction personnel in locations convenient to work stations.

- C. When temporary connections are removed, restore existing water service to its original condition.

#### 3.04 FIRE PREVENTION AND PROTECTION:

- A. Place a capable and qualified person in charge of fire protection. Responsibilities shall include locating and maintaining fire protection equipment and establishing and maintaining safe torch cutting and welding procedures.
- B. Hazard Control: Take all necessary precautions to prevent fire during construction. Do not store flammable or combustible liquids in existing structures. Provide adequate ventilation during use of volatile or noxious substances.
- C. Spark Arresters: Equip all gasoline or diesel powered equipment with spark arresters approved by the U.S. Forest Service.
- D. Locate internal combustion equipment so that exhausts discharge well away for combustible materials.
- E. Smoking: Smoking within temporary storage sheds is prohibited.
- F. Welding: Cutting by torch or welding shall be performed only when adequate fire protection is provided.

#### 3.05 PROTECTION EQUIPMENT REQUIRED:

- A. Work Area: Furnish one extinguisher for each 1,500 square feet of area or major fraction thereof. Travel distance from work area to the nearest extinguisher shall not exceed 75 feet.
- B. Vehicles and Equipment: Provide one extinguisher for each vehicle or piece of equipment.

END OF SECTION

PART 1-GENERAL

## 1.01 DESCRIPTION:

- A. The work of this section consists of furnishing, installing, and maintaining suitable barriers to protect existing facilities and the public from construction operations.

PART 2-PRODUCTS

## 2.01 GENERAL:

- A. Material may be new or used, but shall be suitable for intended purpose. Fences and barriers shall be structurally adequate and neat in appearance.

## 2.02 FENCING:

- A. Required only where indicated on the drawings.

## 2.03 BARRIER AND SIGNS:

- A. ANSI/ D6.1-78 (MUTED), Part VI.

## 2.04 BARRIER TAPE:

- A. Banner Guard, imprinted with "CAUTION: CONSTRUCTION AREA", as manufactured by Reef Industries, Houston, Texas, or approved equal. Furnish a minimum of one roll.

PART 3-EXECUTION

## 3.01 PROTECTION OF PUBLIC:

- A. Barricade or otherwise block off the immediate work area to prevent unauthorized entry to the work area.
- B. Erect and maintain barricades, lights, danger signals, and warning signs in accordance with ANSI/ANSI D6.1-78.
- C. Illuminate barricades and obstructions at night.
- D. Adequately barricade and post open cuts in or adjacent to thoroughfares.
- E. Cover pipes, hoses, power lines crossing sidewalks and thoroughfares with troughs using beveled edge boards.



3.02 BARRIER TAPE:

- A. Install barrier tape where directed by Contracting Officer.
- B. Completely remove barriers no longer needed and when approved by Contracting Officer.

END OF SECTION

PART 1-GENERAL

## 1.01 DESCRIPTION:

- A. The work of this section consists of providing temporary controls.

PART 2-PRODUCTS NOT USEDPART 3-EXECUTION

## 3.01 HOUSEKEEPING:

- A. Keep project neat, orderly, and in a safe condition at all times.
- B. Provide enough refuse containers for collecting construction debris.
- C. Do not burn or bury refuse.
- D. Wet down dry materials and rubbish to prevent blowing dust.
- E. Keep volatile wastes in covered containers.

## 3.02 DISPOSAL:

- A. Unless otherwise specified, all salvaged material becomes the property of the Contractor and shall be disposed of outside the park.
- B. Immediately remove hazardous rubbish from project site. Place other construction debris in refuse containers at least daily. Dispose of refuse at least weekly, in a legal manner, at public or private dumping areas outside the park. Do not burn or bury refuse inside the park.

## 3.03 AIR AND WATER POLLUTION CONTROL:

- A. Take all necessary reasonable measures to reduce air and water pollution by any material or equipment used during construction.
- B. Do not dispose of volatile wastes or oils in storm or sanitary drain. Volatile materials must be removed from the Park for disposal by Contractor.
- C. Do not allow waste materials to be washed into streams or bodies of water. All waste materials shall be disposed of in a manner approved by the Contracting Officer.

END OF SECTION

PART 1-GENERAL

## 1.01 DESCRIPTION:

- A. The requirements of this section consist of furnishing, locating, and removing temporary structures.

PART 2-PRODUCTS

## 2.01 GENERAL:

- A. Temporary structures shall be of noncombustible construction or located a minimum of 30 feet away from other structures.

## 2.02 CONTRACTOR'S FIELD OFFICE:

- A. The Contractor may provide an office for his own use, the size, location, and construction shall be subject to approval of the Contracting Officer.

## 2.03 NOT USED

## 2.04 STORAGE FACILITIES:

- A. Provide temporary weathertight sheds or other covered facilities for storage of materials subject to weather damage. Number and size of structures shall be subject to Contracting Officer's approval.

PART 3-EXECUTION

- A. Contractor's Field Office: Locate where directed by Contracting Officer. Provide cleaning services at regular intervals.
- B. Storage Facilities: Provide when required by Contracting Officer. Locate at designated locations.
- C. Remove structures at completion of work.

END OF SECTION

PART 1-GENERAL

## 1.01 MANUFACTURER'S INSTRUCTIONS:

- A. When contract documents require that installation of work shall comply with manufacturer's printed instructions, provide five copies of instructions to Contracting Officer. Maintain one set of complete instructions at the project site during installation and until completion.
- B. Perform work in accordance with manufacturer's instructions.

## 1.02 TRANSPORTATION AND HANDLING:

- A. Arrange deliveries of materials in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site. Deliver materials in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

## 1.03 STORAGE AND PROTECTION:

- A. Store materials in accordance with manufacturer's instructions, with seals and labels intact, legible and accessible for inspection.
  - 1. Store products subject to damage by the elements in weathertight enclosures.
  - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- B. Exterior Storage:
  - 1. Store fabricated products above the ground, on blocking or skids; prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation. Items may be stored in sheds if Contractor elects.
  - 2. Store base granular materials in a well-drained area on solid surfaces to prevent mixing with foreign material.
- C. Protection After Installation: Provide adequate coverings as necessary to protect installed materials from damage resulting from natural elements, traffic, and subsequent construction. Remove when no longer needed.

## 1.04 MATERIALS SPECIFIED BY REFERENCE STANDARDS:

- A. Select any item meeting that standard.

1.05 APPROVED EQUALS:

- A. For each item proposed as an "approved equal", submit a separate request for approval in accordance with Section 01300. With each request submit supporting data, including:
1. Drawings and samples as appropriate.
  2. Comparison of the qualities of the proposed item with that specified.
  3. Changes required in other elements of the work because of the substitution.
  4. Manufacturer's literature regarding installation, operation and maintenance including schematics for electrical and hydraulic systems, lubrication requirements, and parts lists.
- B. A request for approval constitutes a representation that Contractor:
1. Has investigated the proposed item and determined that it is equal or superior in all respects to that specified.
  2. Will provide the same warranties for the proposed item as for the item specified.
  3. Will coordinate the installation of an approved item, and make such other changes as may be required to make the work complete in all respects.
  4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.
  5. Has determined that the proposed item is compatible with interfacing items.

PART 2-MATERIALS NOT USED

PART 3-EXECUTION NOT USED

END OF SECTION

PART 1-GENERAL

- 1.01 DESCRIPTION: The work of this section consist of demonstrating system and equipment to operating personnel. It also includes training of personnel.
- 1.02 Schedule demonstrations and training periods with Contracting Officer.

PART 2-PRODUCTS NOT USEDPART 3-EXECUTION

- 3.01 INSTRUCTION TO GOVERNMENT PERSONNEL: As specified in individual sections, furnish the services of instructors to train designated personnel in adjustment, operation, maintenance, and safety requirements of equipment and systems. Instructors shall be thoroughly familiar with the equipment and systems and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given after the equipment or system has been accepted and turned over to the Government.

END OF SECTION

PART 1-GENERAL

## 1.01 DESCRIPTION:

- A. The work of this section consists of final cleanup, closeout submittals, and final inspection procedures.

PART 2-PRODUCTS

## 2.01 CLEANING MATERIALS:

- A. As recommended by the manufacturer of surface to be cleaned.

PART 3-EXECUTION

## 3.01 CLEANING:

- A. Remove all tools, equipment, surplus materials and rubbish. Restore or refinish surfaces of existing materials that are marred, scratched, or damaged due to the work of this contract to match original condition. Remove grease, dirt, stains and foreign materials. Vacuum clean interior building areas. Remove debris; sweep paved areas, rake grounds. At time of final inspection, project and site shall be thoroughly clean and ready for use.

## 3.02 PROJECT RECORD DRAWINGS:

- A. Using colored ink, make changes on a set of clean prints of original tracings. Show all changes and revisions to the original design that affect the permanent structures and will exist in the completed work.
- B. Keep record drawings current. Inspection will be made monthly. Certification of accuracy and completeness will be required on monthly payment requisitions. Project record drawings are the property of the Government and shall be delivered to the Contracting Officer before closeout.

## 3.03 CLOSEOUT SUBMITTALS:

- A. Submit before final inspection request:
  - 1. Project Record Drawings: As specified above.
  - 2. Guarantees and Bonds: As specified in individual sections.
  - 3. Spare parts and materials: As specified in individual sections.
  - 4. Special Tools: One set of special tools required to operate,

adjust, dismantle, or repair equipment. Special tools are those not normally found in possession of mechanics or maintenance personnel.

3.04 SUBSTANTIAL COMPLETION AND FINAL INSPECTION:

- A. Submit written certification that project, or designated portion of project, is substantially complete, and request in writing a final inspection. Contracting Officer will make an inspection within 10 days of receipt of request.
- B. When Contracting Officer determines that the work is substantially complete, he will prepare a list of deficiencies to be corrected before final acceptance and issue a Letter of Substantial Completion.
- C. If Contracting Officer determines that the work is not substantially complete, he will immediately notify Contractor in writing, stating reasons. After completing work, Contractor shall resubmit certification and request a new final inspection.

3.05 ACCEPTANCE OF THE WORK:

- A. After all deficiencies have been corrected, a Letter of Acceptance will be issued.

3.06 POST-CONSTRUCTION INSPECTION:

- A. Before expiration of warranty period, Contracting Officer will inspect project and notify Contractor in writing of all deficiencies.

END OF SECTION



PART 1-GENERAL

## 1.01 DESCRIPTION:

- A. The work of this section consists of furnishing operation and maintenance manuals and providing instruction for Government personnel.

PART 2-PRODUCTS

## 2.01 BINDERS:

- A. Commercial quality, hard back, three-ring binders. Maximum ring sizes shall be three inches.

## 2.02 POSTED OPERATING INSTRUCTIONS:

- A. Frame instructions under nonglare glass or approved laminated plastic. Provide weather resisting materials.

PART 3-EXECUTION

## 3.01 FORM OF SUBMITTALS:

- A. Provide typed or printed label identifying binder as operating and maintenance instructions. List title of project, contract number, and location of equipment.
- B. Text: Furnish manufacturer's printed data or sheets neatly typewritten on 8-1/2-inch by 11 inch, 20 pound minimum white paper. Provide indexed tabs.
- C. Drawings: Bind in with text. Provide reinforcement rings. Fold larger drawings to the size of the text pages.

## 3.02 CONTENT OF MANUAL

- A. Summary: Prepare a summary for each binder. Include the following:
  - 1. Description of product and major component parts of equipment.
  - 2. A list of products and equipment indexed to the content of the binder. Identify each by name used in contract documents.
  - 3. A list giving the name, address and telephone number of:
    - a. Contractor, including responsible principal.
    - b. Subcontractor or installer.

- c. Maintenance contractor, as appropriate.
- d. Nearest source of supply for parts.
- e. Nearest manufacturer's representative.
- f. Nearest service organization, as appropriate.

B. Data:

- 1. Include only those sheets pertinent to the specific product, equipment, or system.
- 2. Annotate each sheet to identify clearly the specific product or part installed. Delete references to inapplicable information.

C. Written Text to Supplement Data:

- 1. Organize in a consistent format.
- 2. Provide a logical sequence of instructions.

D. Drawings:

- 1. Supplement product data with drawings showing the relationship of component parts of equipment and systems.
- 2. Coordinate drawings with information in project record drawings to ensure correct illustration of completed installation.

E. Warranties, Bonds, and Service Contracts: Provide a copy of each of the following information:

- 1. Procedures in event of failure.
- 2. Circumstances that might affect the validity of warranties, bonds, or service contracts.

3.03 MANUALS FOR PRODUCTS, MATERIALS, AND FINISHES

A. Submit two copies of complete manual.

B. Content: Provide complete information for architectural products, applied materials, and finishes.

- 1. Manufacturer's data, including catalog number, size, composition, color and texture designation, and information for re-ordering.

2. Instructions for care and maintenance, including manufacturer's recommendations for cleaning agents and methods; cautions against detrimental cleaning agents and methods; and recommended schedule for cleaning and maintenance.

END OF SECTION

PART 1-GENERAL

## 1.01 DESCRIPTION:

- A. The work of this section consists of leak testing water lines and related valves and fittings. Rejected work shall be retested.
- B. Testing Methods: Water lines - high pressure water test.

## 1.02 QUALITY ASSURANCE:

Water test gauges shall be ANSI B40.1-80, Grade 2A (plus or minus 0.5 percent of full scale accuracy), dial range approximately twice the required test pressure.

## 1.03 SUBMITTALS: As specified in Section 01300.

- A. Accuracy certification by approved independent testing laboratories for test gauges. Certifications shall be dated no more than 90 days before actual system testing.
- B. Before testing, provide the following information:  
  
High Pressure Water Test: Describe the proposed method for disposal of water used in line testing.

## 1.04 PROJECT CONDITIONS:

- A. Testing shall not be performed until each system has been flushed or thoroughly cleaned in accordance with procedures in the sections that describe water line installation.
- B. Test potable water lines before disinfecting.
- C. Water for Flushing and Testing: See Section 01510.

PART 2-PRODUCTS - None.PART 3-EXECUTION

## 3.01 GENERAL:

- A. Perform testing in the Contracting Officer's presence. Notify Contracting Officer at least 48 hours prior to testing.
- B. Prepare each section for testing, using adequate bracing; protect system equipment susceptible to damage by test pressures; make provision for installation of Government pressure gauge in parallel with Contractor's gauge, if so requested; and maintain services where required.

### 3.03 WATER LINES:

- A. Fill line with water; eliminate all air. Allow a minimum standing time of 2 hours for materials to absorb water.
- B. Raise the internal pressure by pumping in water to 50 psig above the maximum anticipated service pressure (ignore water hammer) at the point of test gauge attachment.
- C. Maintain the test pressure within 5 psig for 2 hours by pumping in metered quantities of makeup water.
- D. The line section will have passed the test if the metered makeup water does not exceed that determined by the following formula:  
Leakage in gallons equals 0.00002 times the nominal diameter of pipe in inches times the length of the test section in feet times the square root of the test pressure in psig.
- E. Do not use paints, asphalts, tars or other types of pipe compounds to eliminate leaks.
- F. Replace leaking fittings, nipples or lengths of pipe.

END OF SECTION

PART 1-GENERAL

- 1.01 DESCRIPTION: The work of this section consists of furnishing and installing the water supply piping and all accessories and appurtenances.
- 1.02 RELATED WORK: Section 02675 - Disinfection of Water Lines; and 02601 - Testing of Water Lines.
- 1.03 QUALITY ASSURANCE: Meet the requirements of the City and County of San Francisco Plumbing Code, except as specifically modified herein.
- 1.04 SUBMITTALS: As specified in Section 01300. Submit manufacturer's data for valves, specialties and hangers.
- 1.05 PROJECT CONDITIONS: Correct defective surfaces or notify Contracting Officer.
- 1.06 CLOSEOUT SUBMITTALS: As specified in Section 01700.

PART 2-PRODUCTS

- 2.01 WATER PIPING AND FITTINGS, ABOVEGROUND:
  - A. Piping and Fittings: Standard weight threaded galvanized steel.
  - B. Flanges: Cast bronze, 125-pound, ASME Standard.
    - 1. Bolts and Nuts: Square head machine bolts with heavy hex nuts, galvanized.
    - 2. Gaskets: 1/16-inch, full faced, for potable water service.
  - C. Dielectric Connections: Epco Sales, Inc., Cleveland, Ohio, or approved equal.
- 2.02 GATE VALVES: Shall conform to AWWA Standard C500 for a minimum working pressure of 150 psi. Gate valves shall be iron body, bronze mounted, double disk with O-ring seals. Valves shall be opened by turning to the left. Valves shall be furnished complete with operating wheels.
- 2.03 HANGERS, ANCHORS AND GUIDES: Adjustable band, copper-plated and plastic coated hanger, Figure 381, Fee and Mason Division, A-T-O, Inc., Manasquan, New Jersey, or approved equal.

PART 3-EXECUTION

- 3.01 GENERAL:
  - A. Install materials and equipment as shown in accordance with the San Francisco Plumbing Code and the NAPHCC/ASPE National Standard Plumbing Code and as specified herein. The plumbing system shall be

installed complete with necessary fittings, valves and accessories.

- B. Locate equipment requiring service and maintenance in fully accessible position.
- C. Runs and arrangement of piping shall be as indicated, subject only to such changes and modifications as may be necessary to suit actual conditions, to avoid interference or conflict with work of other sections. The work shall be carefully laid out in advance and unnecessary cutting of construction shall be avoided. Damage to building, piping, wiring, or equipment as a result of cutting shall be repaired by mechanics skilled in the trade involved. Pipe openings shall be closed with caps or plugs during installation. The piping system shall be arranged and installed to permit draining. All piping shall be anchored to prevent movement.
- D. Joints: Installation of pipe and fittings shall be made in accordance with the manufacturer's recommendations. Threaded joints shall have American Standard taper pipe threads conforming to ANSI B2.1. Only male pipe threads shall be coated with graphite or with an approved graphite compound, or with an inert filler and oil, or shall have a polytetrafluoroethylene tape applied. Unions shall be used on pipe sizes 2-1/2 inches and smaller; flanges shall be used on pipe sized 3 inches and larger.
- E. Hang horizontal piping runs from construction above except where indicated to be placed upon pier bents. Locate as closely as possible to structural members or bottom of slabs or beams to obtain maximum head room.
- F. Water and other services shall be fully connected to each individual piece of apparatus with required piping, unions, flanges, valves and other needed appurtenances.
- G. Each branch pipe shall be controlled by a gate valve where it connects to the supply main or riser.
- H. Use reducing fittings wherever a change in pipe size occurs. The use of bushings will not be permitted.
- I. Provide piping with union to permit alterations and repairs.

### 3.02 HANGERS, ANCHORS, GUIDES:

- A. Support piping to prevent vibration and to secure piping in place. Arrange to provide for expansion and contraction.
- B. The spacing of hangers shall be not greater than 12 feet on center for pipe larger than 1 inch.
- C. Support vertical lines at bases by an approved hanger placed in the horizontal line near the riser.
- D. Do not hang piping from piping of other trades. A common trapeze,

properly supported and pitched, may be used.

3.03 TEST AND ADJUSTMENTS: Section 02601.

3.04 DISINFECTION OF WATER SYSTEM: Section 02675. Disinfect all water piping and equipment upon completion of piping installation. Following disinfection, flush water from the system through its extremities. Continue flushing until samples show the quality is comparable with the public water supply and complies with requirements of the public health authority having jurisdiction.

3.05 COATING OF PLUMBING:

- A. Protect name tags and plates, hardware, equipment and all factory coatings from damage. Damaged coatings shall be repaired in strict accordance with the manufacturer's recommendations.
  - 1. Coated Surface Preparation: Surfaces shall be free of dirt, grease, and other foreign matter that would adversely affect the finished appearance or protective properties of the coating applied. Remove rust and mill scale by power tool cleaning as specified by SSPC. Remove weld flux spatters and alkali contaminants. Rinse with water. Wire brush shop prime coats that have been ruptured or marred to bare metal and recoat.
  - 2. Galvanized Metal Surfaces: Wash thoroughly with mineral spirits and etch with a solution of chemical phosphoric metal etch, such as xylol, or other approved solution. Allow to dry.
- B. Schedule of Primers:
  - 1. For ferrous metal surfaces, including those factory applied prime coats that have been marred or ruptured, one coat of Pittsburgh Paint Rust Inhibitive Primer No. 8-2, by PPG Industries, Inc., Pittsburgh, Pennsylvania, or approved equal.
  - 2. Apply one coat of Pittsburgh Waterspar, white, galvanized steel primer, by PPG Industries, Inc., Pittsburgh, Pennsylvania, or approved equal.

END OF SECTION



PART 1-GENERAL

- 1.01 DESCRIPTION: The work of this section consists of the disinfection of all portions of the water system, including valves and stops and any portion of the existing connecting system that might have become contaminated during construction activities.

PART 2-PRODUCTS

- 2.01 CALCIUM HYPOCHLORITE: HTH, Olin Chemicals, Olin Corporation, Stamford, Connecticut, or similar product having approximately 70 percent available chlorine.
- 2.02 MIXTURE: A 5-percent solution shall be made by mixing 5 percent of powder with 95 percent water, by weight, first into a paste, then thinning to slurry by the addition of water.

PART 3-EXECUTION

- 3.01 DOSAGE: Place enough disinfecting material in the system to ensure a chlorine dosage of 50 parts per million. This is equivalent to 10 ounces of commercial hypochlorite powder to each 1,000 gallons of water.
- 3.02 FILLING SYSTEM: Fill entire system with the chlorine solution. Open all taps and valves and leave open until a strong odor of chlorine is noticeable in the water coming from the outlets, after which close the taps and valves.
- 3.03 TEST PERIOD: Allow chlorinated water to remain in the system a minimum of 24 hours, then thoroughly flush the system. During retention period, operate all valves, stops, and other appurtenances to assist this disinfection.
- 3.04 DISPOSAL OF CHLORINATED WATER: Dispose of chlorinated water to the sanitary system.
- 3.05 BACTERIOLOGICAL EXAMINATION: After the system has been thoroughly flushed, take samples from representative points in the system, in sterile bottles, and submit to proper authorities as directed for bacteriological examination. If the report is unsatisfactory, repeat the disinfection procedure until satisfactory results are obtained.

END OF SECTION

PART 1-GENERAL

- 1.01 DESCRIPTION: This section includes basic requirements of a common or administrative nature that pertain to all electrical work.
- 1.02 WORK INCLUDED: In accordance with the specifications and as shown, furnish, install, test, and place in satisfactory and successful operation all equipment, materials, devices, and necessary appurtenances to provide a complete and operable electrical system. Electrical work also includes wiring and connections required for electrical equipment furnished under other divisions, and 16050, 16191, 16420 and 16450.
- 1.03 NOT USED
- 1.04 SUBMITTALS: As specified in Section 01300. Submit proof of electricians license.
- 1.05 QUALITY ASSURANCE:
- A. Workman Qualifications: All electrical work shall be performed by licensed electricians or under the direct supervision of a licensed electrician.
  - B. Codes and Regulations:
    - 1. All work shall meet requirements of governing codes and regulations, NEC, 1984 edition, NESC, and other national fire codes of NFPA. Advise the Contracting Officer of conflicting codes or conflicts between codes and drawings and specifications. When the requirements of specifications or drawings are more stringent than the codes, regulations, or standards, the specifications or drawings shall prevail.
    - 2. The electrical installation shall meet the requirements of NECA Standard of Installation, except where otherwise specified.
  - C. UL Listing: All electrical materials and equipment shall meet requirements of the applicable standards of UL if UL standards exist for such materials and equipment. The UL authorized listing mark is acceptable as evidence that the materials meet this requirement. In lieu of UL authorized listing mark, the Contractor may submit independent proof satisfactory to the Contracting Officer that the materials meet the published standards. Materials and equipment shall be used only for their intended use.
  - D. Standard Products: Provide materials and equipment that are products of manufacturers regularly engaged in the manufacture of the products and are the latest standard design.
  - E. Finished surfaces of existing facilities that are marred, scratched, or damaged shall be refinished to match original condition.

Building and structure surfaces that have been altered for the proper installation of electrical equipment shall be restored by skilled personnel of the trades involved at no additional expense to the Government.

1.06 INTENT OF CONSTRUCTION DRAWINGS:

- A. Electrical drawings do not attempt to show complete details of building construction that affect installation. Diagrams are schematic only and do not necessarily show physical arrangement of equipment. Refer to drawings of other trades for additional details which affect work.
- B. Conduit and ground connections are shown diagrammatically only. Layout does not necessarily show total number of conduits or conductors for circuits required and should not be used for obtaining quantities for linear runs of conduits or wires. Locations of indicated runs are not intended to show actual routing of conduits. Provide additional conduits and wire wherever needed to complete installation of specific equipment furnished. Layouts should not be used for obtaining quantities or for linear runs of conduit or wire.
- C. Locations of outlets on drawings are approximate and may be distorted for clarity in representation.
- D. Install electrical outlets and other equipment clear of and in proper relation to other equipment and items.
- E. Changes such as offsetting conduit runs, moving outlets, or other minor changes necessary to facilitate installation shall be made at no additional expense to the Government.

1.07 COORDINATION OF WORK: Coordinate electrical work with the work of the various trades on the project.

1.08 CLOSEOUT SUBMITTALS: As specified in Section 01700. Submit keys, operating handles, special tools, and schematic diagrams and project record drawings.

PART 2-PRODUCTS

2.01 EQUIPMENT ENCLOSURES: Enclosures shall meet NEMA Type 12 requirements, unless otherwise shown or specified.

PART 3-EXECUTION

3.01 INSPECTION: All electrical work shall be demonstrated to operate satisfactorily and in accordance with the requirements of the drawings and specifications. Before final inspection, remove the front covers on all panelboards and gutters. Replace covers after the final inspection is completed.

3.02 TESTING:

- A. General: Make all specified tests in the presence of the Contracting Officer. Furnish all instruments and provide qualified personnel to perform all tests in accordance with the drawings and specifications. Perform all tests at no additional expense to the Government. Operate all electrical equipment within the ranges specified by manufacturer. Correct any defect revealed by the tests.
- B. Balance Test: Test for proper load balance on the system, and make adjustments as required.

3.03 DEMONSTRATION: As specified in Section 01670. Demonstrate systems and instruct Government personnel in correct operation. Familiarize them with locations of switches, junction boxes, and circuiting, including changes as shown on project record drawings.

3.04 EXISTING EQUIPMENT AND WIRING:

- A. Surface Wiring Systems to be Abandoned: Remove conduit, wire, boxes and other components to nearest outlet, device, or panelboard that is to remain in use.
- B. Concealed Wiring Systems to be Abandoned: Remove wire, devices, and other components to nearest outlet, device, or panelboard that is to remain in use. Install blank faceplates on abandoned outlet boxes.
- C. Modify existing electrical installation as required by new construction. Provide necessary conduit system, wire, and connections for a complete and operable system.
- D. Existing equipment specified to be removed becomes property of Contractor and shall be removed from site, unless otherwise specified.

END OF SECTION

PART 1-GENERAL

- 1.01 DESCRIPTION: The work of this section consists of general electrical materials and methods. Electrical materials that are a part of equipment specified under other sections shall meet the requirements of this section, unless part of larger factory-assembled equipment.
- 1.02 SUBMITTALS: As specified in Section 01300.
- A. Submit manufacturer's literature for raceways and fittings, boxes, wires and cables, wiring devices, nameplates, legend plates, labels, panelboards, and safety switches.
  - B. Submit catalog cuts, manufacturer's published time-current curves of the transformer high side fuse and main secondary breaker, shop drawings and operational data for transformers.
- 1.03 QUALITY ASSURANCE: Section 16010.
- 1.04 CLOSEOUT SUBMITTALS: As specified in Section 01700.
- A. Provide operating instructions.
  - B. Provide three spare fuses of each size and type used.

PART 2-MATERIALS:

- 2.01 RACEWAYS AND FITTINGS:
- A. Raceway Systems: Meet requirements of applicable UL standards.
    - 1. Rigid galvanized steel conduit, UL 6-81 (threaded).
    - 2. Flexible steel conduit, ANSI/UL 1-79, listed for grounding.
    - 3. Wireways, auxiliary gutters, and associated fittings, ANSI/UL 870-84.
    - 4. Busways and associated fittings, ANSI/UL 857-81.
  - B. Hangers and Guides: Adjustable band, copper-plated and plastic coated hanger, Figure 381, Fee and Mason Division, A-T-O, Inc., Manasquan, New Jersey, or approved equal.
- 2.02 WIRE AND CABLE:
- A. General:
    - 1. Color Coding: All wires on the same leg or phase shall have the same color code, each leg or phase being a different color. Black, red, and blue shall be used for three-phase, except that for delta secondary voltages where the midpoint of one phase is grounded, the conductor having the higher voltage to ground

shall be orange; black and red for single-phase; white for neutral; and green for ground. Neutral and equipment grounding conductors sized No. 6 AWG and larger may be marked with colored plastic marking tape at each end and at every point where wire is accessible; conductors sized smaller than No. 6 AWG shall be color coded by factory insulation pigmentation.

2. Unless otherwise shown, conductors shall be rated for 600 volts. Conductor size shall meet requirements of NEC, or the sizes shown on the drawings if larger, and for feeder and branch circuits, shall be No. 12 AWG minimum. Unless otherwise shown, wire sizes are for copper. Copper clad conductors are not acceptable.
3. Feeder Circuits: Feeder circuits shall be copper. Aluminum conductors are not acceptable.
4. Branch Circuits: Branch circuits shall be copper.
5. Feeder and Branch Circuit Equipment Grounding Conductor: Section 16450.

2.03 PULL AND JUNCTION BOXES: Provide one for each outlet, switch, receptacle, or combination, and each junction point, sized as shown. Unless otherwise shown, boxes shall be weatherproof cast metal, galvanized, threaded hub.

2.04 CIRCUIT BREAKERS: Thermal-magnetic, unless otherwise shown. Multi-pole breakers shall automatically open all poles when an overload occurs in any pole. External tie-handle construction where adjacent poles are on the same phase or leg will not be accepted. Tandem breakers are not acceptable.

2.05 TAP BOXES: Tap boxes shall have a NEMA 12, stainless steel enclosure. The internal construction shall meet all requirements of a NEMA approved (similar device) regarding spacing, structural integrity, working clearances, and ampacity requirements. Shop drawings shall be submitted on both Tap Box A and Tap Box B.

2.06 SAFETY SWITCHES: Quick-make, quick-break, NEMA type HD heavy duty switches, NEMA 12 enclosure unless otherwise shown, switches shall be fuse type, 2-pole, with solid neutral and ground bus. Switches shall have interrupting rating equal to or greater than interrupting rating of its fuses and the system short circuit capacity at the point of each application. Voltage ratings shall be that of the system voltage at point of application.

2.07 FUSES: Standard single element type unless otherwise shown.

2.08 MISCELLANEOUS METAL AND METAL FRAMING:

- A. Structural Steel Shall conform with ASTM A36. Tubing shall conform to ASTM A500 or 501. Bolts shall be type 316 stainless steel and conform to ASTM A307. Welding shall conform to AWS Specifications



with E70 electrodes. Welders shall be qualified in accordance with AWS D1.1. All work shall be in accordance with AISC Manual of Steel Construction.

- B. Steel fabrications shall be hot dip galvanized after fabrication and hole drilling. Galvanizing shall be in accordance with ASTM A153, A386 and A525 with zinc coatings applied over properly cleaned and prepared surfaces. Stainless steel items need not be galvanized. Field repair damaged coatings with repair paint conforming to Military Specifications DOD-P-21035 and shall be accomplished following proper cleaning and surface preparation.

## 2.09 NAMEPLATES, LEGEND PLATES, AND LABELS:

- A. Nameplates: Laminated sheet plastic, approximately 1/16 inch thick, with engraved white letters on a black background, with adhesive backing and mounting screw holes. Minimum heights of letters, 5/16 inch. Card holders are not acceptable.
- B. Legend Plates: Type KN-3 standard legend plates, Square D, Palatine, Illinois, or approved equal.
- C. Labels or Stencils: Minimum 1/4 inch high letters. Embossed tape labels are acceptable.

## PART 3-EXECUTION

### 3.01 ABOVEGROUND RACEWAY:

- A. Replace crushed, deformed, or clogged raceway.
- B. Make cuts square, removing sharp edges.
- C. Run raceway plumb, level and in a direct line, with long sweeping bends and offsets. Make changes in direction of raceway with symmetrical bends or metal fittings. Bends shall not kink or reduce the internal diameter.
- D. Make joints tight. Do not use red lead or other nonconductive material at joint locations before joints are made. Provide expansion joints as necessary for pvc.
- E. Securely mount raceway using manufactured supports, connectors, and securing devices.
- F. Clean raceway before pulling in conductors. In raceway without wiring, install nylon pull string of minimum 100 pound strength, allowing 12 inches excess at each end.
- G. Hangers, Anchors and Guides:
  - 1. Support piping to prevent vibration and to secure piping in place. Arrange to provide for expansion and contraction.

2. The spacing of hangers shall be not greater than 12 feet on center for pipe 1 inch and larger.

3.02 WIRE AND CABLE: Unless otherwise shown, install all interior wire and cable in raceways.

- A. Feeder and Branch Circuit Equipment Grounding Conductor: Section 16450.
- B. Taps and Splices: Permitted only in junction or outlet boxes. Use only CO/ALR factory-manufactured insulated-wire connectors, bolted and taped connectors, or crimp connectors. With aluminum conductors, use only crimp connectors.

3.03 WIRING DEVICES:

- A. Mounting Heights to Centerline of Plate: As shown.
- B. Install receptacles and switches with a minimum of 6 inches lateral separation. Through-the-wall type boxes are not permitted.
- C. Remove fiber washers on mounting screws before installing device. Ground receptacles that are in metal boxes with green grounding jumpers. Mounting and terminal screws shall be tight. Firmly attach plates, plumb and level.

3.04 METAL FRAMING:

- A. Install where electrical equipment is to be mounted where shown. Contracting Officer shall approve installation in advance.
- B. Clean cuts and welds. Coat unpainted surfaces with cold application zinc galvanizing. coat cuts and welds on painted surfaces with zinc chromate primer and finish to match existing paint.

3.05 INDIVIDUALLY ENCLOSED CIRCUIT BREAKERS: Install with top of enclosure between 54 inches and 78 inches off ground or floor.

3.06 NAMEPLATES: Identify all disconnect switches. Fasten nameplates with finish screws or rivets.

3.07 TRANSFORMERS:

Transformers shall be general-purpose dry-type in a weatherproof enclosure. Transformers shall have not less than two windings per phase. Use of auto-transformers is not allowed. Transformers with sound levels greater than 50 decibels shall be installed on resilient vibration-islating mountings to prevent amplification of sound. Audible sound-levels tests shall be made in accordance with NEMA Pub. No. ST 20. Transformers shall be the quiet type with sound level not exceeding the following:



Transformer  
rating, kVA

Average sound  
level, decibels

10-50  
51-150

45  
50

- A. Transformer Stations: Transformer stations shall be of outdoor type, as required by the locations indicated on the drawings and have the ratings and arrangements indicated. Medium-voltage ratings of cable terminations for use on primary systems shall be between phases for 133 percent insulation level. The voltage rating of protective devices for use on primary or secondary systems shall be not less than the nominal voltage of the system to which they are connected.
- B. Installation: Units shall be carefully installed so as not to scratch finishes. After installation units shall be re-painted per manufacturer's recommendations.
- C. Factory Tests:
1. Transformer Tests: NEMA TR1. Certified copies of test data for the following tests shall be submitted and approval received before delivery of equipment to the project site.
  2. Routine Tests: Routine tests shall be made by the manufacturer of each transformer to insure that the design performance is maintained in production.
  3. Design Tests: Design test reports will be accepted as proof of compliance with design test requirements.

END OF SECTION

PART 1-GENERAL

- 1.01 DESCRIPTION: The work of this section consists of grounding electrical systems and noncurrent carrying metallic parts of electrical equipment and raceway.
- 1.02 QUALITY ASSURANCE: Section 16010.
- 1.03 SUBMITTALS: As specified in Section 01300. Triplicate results of made electrode ground resistance tests.

PART 2-PRODUCTS

- 2.01 GROUNDING CONDUCTORS: Copper, without splice throughout its length, sized according to NEC or as shown; bare or green insulated wire is acceptable unless otherwise shown.
- 2.02 BONDING JUMPERS: Bare copper. Jumpers for service equipment shall be the size of grounding electrode conductor which shall be sized according to NFPA 70-84, NEC Table 250-94. Jumpers for interior wiring raceways and enclosures shall be sized according to NFPA 70-84, NEC Table 250-95.
- 2.03 EQUIPMENT GROUNDING CONDUCTORS: Insulated copper, sized according to NFPA 70-84, NEC 250-95. Insulation shall be of the same type as the respective circuit. See Section 16050 for color coding requirements.

PART 3-EXECUTION

- 3.01 SERVICE GROUNDING: Connect neutral of electrical systems to grounding conductor on supply side only of service entrance equipment within service equipment enclosure. Do not connect neutral to ground on load side of service disconnecting means except to electric ranges and dryers. Bond meter sockets to service neutral. Bond service equipment enclosures and service raceways to grounding conductor within service equipment enclosures. Provide service conduits with grounding locknuts or grounding bushings; provide service enclosures with grounding connectors, lugs, or clamps. Connect grounding conductor to grounding electrode system and to metallic cold water piping system near entrance at building, if available. Point of attachment shall be accessible and located in protected area. Attach grounding conductor to piping or electrodes with bolted brass or bronze clamps. Connect conductor to clamp by lugs or pressure connectors. Clamps of sheet metal type are not acceptable. Where grounding electrode includes an underground water piping system, ensure continuity by providing bonding jumpers across water meters, nonconducting sections, and fittings which can be disconnected.
- 3.02 EQUIPMENT GROUNDS AND BONDS: Ground metallic raceway systems, enclosures, and noncurrent carrying metallic parts of electrical equipment. Enclosures and noncurrent carrying metal parts are not considered grounded by contact with grounded metallic raceway system.

Install a separate ground wire in all feeder and branch circuit raceway systems, both metallic and nonmetallic, to serve as the equipment grounding conductor. Ensure electrical continuity of raceway systems. Where raceways connect to enclosures, remove nonconducting coatings. Make raceway connections at enclosures tight to ensure continuity and supplement with jumpers. Provide bonding jumpers across expansion joints and telescoping sections of metallic raceway. Establish continuity between outlet boxes or approved ground yokes are utilized. Do not use red lead or other nonconducting material at metallic conduit joints before assembly.

- 3.03 SEPARATELY DERIVED SYSTEMS: Where separately derived systems, such as dry-type transformers, are installed, they shall be grounded according to NEC Section 250-26.
- 3.04 OTHER GROUNDING SYSTEMS: Unless otherwise shown, if other grounding systems, such as for a lightning protection system, are present at or within 50 feet of the building or structure served, bond the two systems together with bare copper ground wire, sized to the larger of the two grounding electrode conductor sizes.

END OF SECTION